



Module 13: WLAN Configuration

Instructor Materials

Switching, Routing, and Wireless Essentials v7.0
(SRWE)



13.1 Remote Site WLAN Configuration

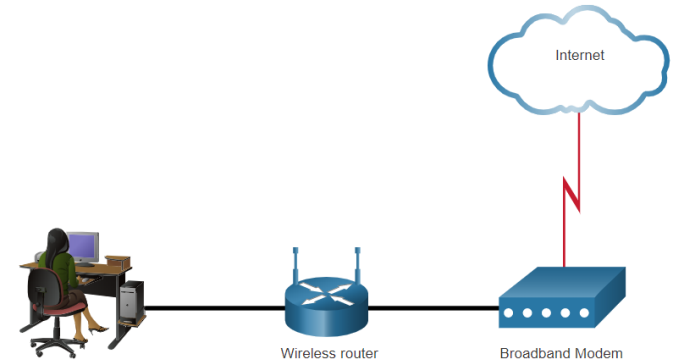
Remote Site WLAN Configuration

The Wireless Router

Remote workers, small branch offices, and home networks often use a small office and home router.

- These “integrated” routers typically include a switch for wired clients, a port for an internet connection (sometimes labeled “WAN”), and wireless components for wireless client access.
- These wireless routers typically provide WLAN security, DHCP services, integrated Name Address Translation (NAT), quality of service (QoS), as well as a variety of other features.
- The feature set will vary based on the router model.

Note: Cable or DSL modem configuration is usually done by the service provider’s representative either on-site or remotely.



Remote Site WLAN Configuration

Log in to the Wireless Router

Most wireless routers are preconfigured to be connected to the network and provide services.

- Wireless router default IP addresses, usernames, and passwords can easily be found on the internet.
- Therefore, your first priority should be to change these defaults for security reasons.

To gain access to the wireless router's configuration GUI

- Open a web browser and enter the default IP address for your wireless router.
- The default IP address can be found in the documentation that came with the wireless router or you can search the internet.
- The word **admin** is commonly used as the default username and password.

Remote Site WLAN Configuration

Basic Network Setup

Basic network setup includes the following steps:

- Log in to the router from a web browser.
- Change the default administrative password.
- Log in with the new administrative password.
- Change the default DHCP IPv4 addresses.
- Renew the IP address.
- Log in to the router with the new IP address.

Remote Site WLAN Configuration

Basic Wireless Setup

Basic wireless setup includes the following steps:

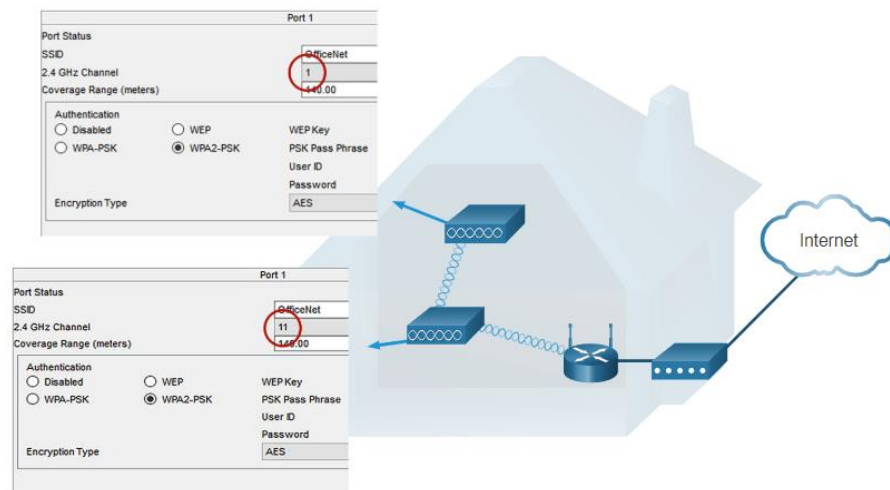
- View the WLAN defaults.
- Change the network mode, identifying which 802.11 standard is to be implemented.
- Configure the SSID.
- Configure the channel, ensuring there are no overlapping channels in use.
- Configure the security mode, selecting from Open, WPA, WPA2 Personal, WPA2 Enterprise, etc..
- Configure the passphrase, as required for the selected security mode.

Remote Site WLAN Configuration

Configure a Wireless Mesh Network

In a small office or home network, one wireless router may suffice to provide wireless access to all the clients.

- If you want to extend the range beyond approximately 45 meters indoors and 90 meters outdoors, you create a wireless mesh.
- Create the mesh by adding access points with the same settings, except using different channels to prevent interference.
- Extending a WLAN in a small office or home has become increasingly easier.
- Manufacturers have made creating a wireless mesh network (WMN) simple through smartphone apps.

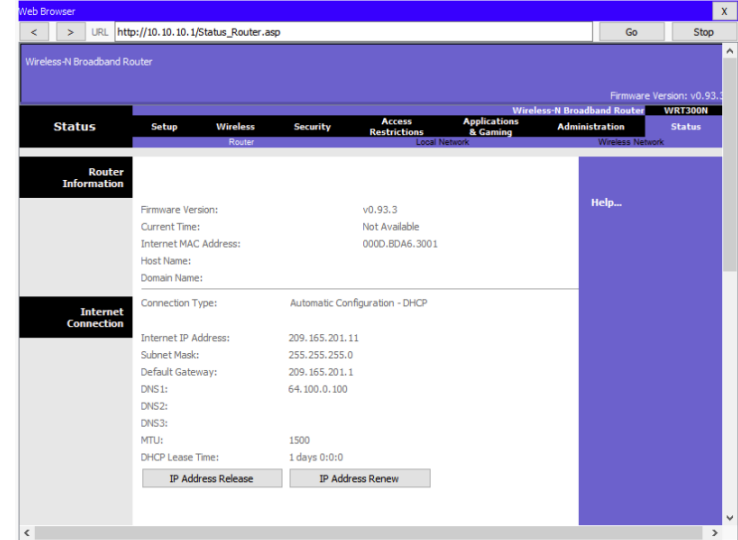


Remote Site WLAN Configuration

NAT for IPv4

Typically, the wireless router is assigned a publicly routable address by the ISP and uses a private network address for addressing on the LAN.

- To allow hosts on the LAN to communicate with the outside world, the router will use a process called Network Address Translation (NAT).
- NAT translates a private (local) source IPv4 address to a public (global) address (the process is reversed for incoming packets).
- NAT makes sharing one public IPv4 address possible by tracking the source port numbers for every session established by a device.
- If your ISP has IPv6 enabled, you will see a unique IPv6 address for each device.



Remote Site WLAN Configuration

Quality of Service

Many wireless routers have an option for configuring Quality of Service (QoS).

- By configuring QoS, you can guarantee that certain traffic types, such as voice and video, are prioritized over traffic that is not as time-sensitive, such as email and web browsing.
- On some wireless routers, traffic can also be prioritized on specific ports.

Basic

Advanced

Cancel

Apply

Advanced Home

QoS Setup

Setup

Internet Setup

Wireless Setup

LAN Setup

QoS Setup

Storage

Security

Administration

Advanced Setup

#	Qos Policy	Priority	Description
1	IP Phone	High	IP Phone applications
2	Counter Strike	High	Online Gaming Counter Strike
3	Netflix	High	Online Video Streaming Netflix
4	FTP	Medium	FTP Applications
5	WWW	Medium	WWW Applications
6	Gnutella	Low	Gnutella Applications
7	SMTP	Medium	SMTP Applications

Edit

Delete

Delete All

Add Priority Role

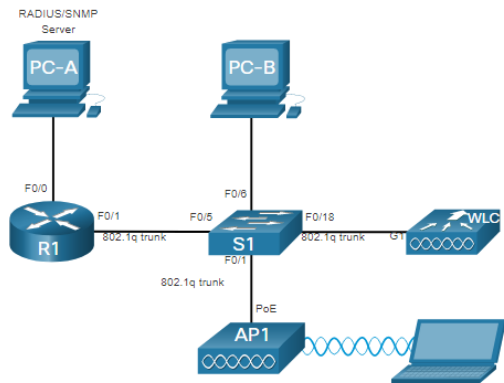
13.2 Configure a Basic WLAN on the WLC

Configure a Basic WLAN on the WLC

WLC Topology

The topology and addressing scheme used for this topic are shown in the figure and the table.

- The access point (AP) is a controller-based AP as opposed to an autonomous AP, so it requires no initial configuration and is often called lightweight APs (LAPs).
- LAPs use the Lightweight Access Point Protocol (LWAPP) to communicate with a WLAN controller (WLC).
- Controller-based APs are useful in situations where many APs are required in the network.
- As more APs are added, each AP is automatically configured and managed by the WLC.



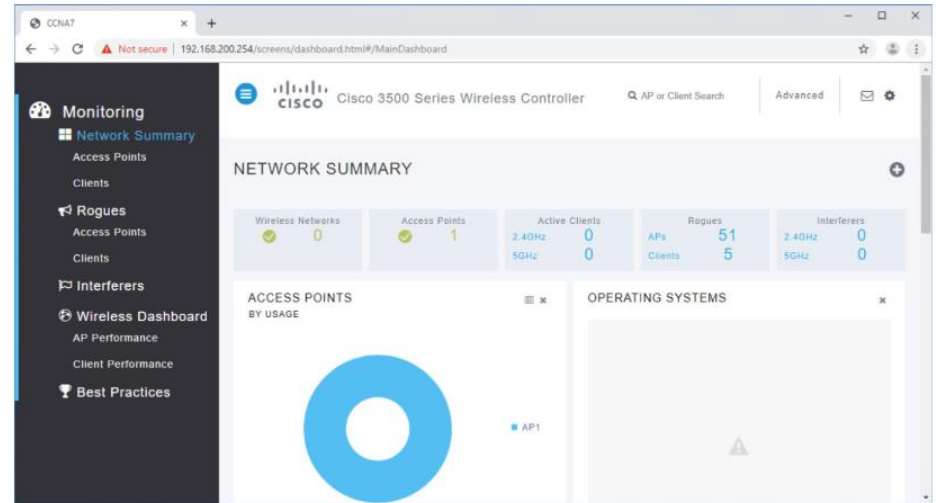
Device	Interface	IP Address	Subnet Mask
R1	F0/0	172.16.1.1	255.255.255.0
R1	F0/1.1	192.168.200.1	255.255.255.0
S1	VLAN 1	DHCP	
WLC	Management	192.168.200.254	255.255.255.0
AP1	Wired 0	192.168.200.3	255.255.255.0
PC-A	NIC	172.16.1.254	255.255.255.0
PC-B	NIC	DHCP	
Wireless Laptop	NIC	DHCP	

Configure a Basic WLAN on the WLC

Log in to the WLC

Configuring a wireless LAN controller (WLC) is not that much different from configuring a wireless router. The WLC controls APs and provides more services and management capabilities.

- The user logs into the WLC using credentials that were configured during initial setup.
- The **Network Summary** page is a dashboard that provides a quick overview of configured wireless networks, associated access points (APs), and active clients.
- You can also see the number of rogue access points and clients.



Configure a Basic WLAN on the WLC

View AP Information

Click **Access Points** from the left menu to view an overall picture of the AP's system information and performance.

- The AP is using IP address 192.168.200.3.
- Because Cisco Discovery Protocol (CDP) is active on this network, the WLC knows that the AP is connected to the FastEthernet 0/1 port on the switch.
- This AP in the topology is a Cisco Aironet 1815i which means you can use the command-line and a limited set of familiar IOS commands.

The screenshot displays the 'ACCESS POINT VIEW' for AP1. On the left is a dark sidebar menu with options: Monitoring, Network Summary, Access Points, Clients, Rogues, Interferers, Wireless Dashboard, AP Performance, Client Performance, and Best Practices. The main content area is titled 'ACCESS POINT VIEW' and 'GENERAL'. It shows a green wireless router icon and the following details:

- AP Name: AP1
- Location: default location
- MAC Address: 2c:4f:52:60:37:e8
- IP Address: 192.168.200.3
- CDP / LLDP: Switch, FastEthernet0/1
- Ethernet Speed: 100 Mbps
- Model / Domain: AIR-CT5502-K9 / 802.11a-B
- Power status: PoE/Full Power
- Serial Number: FCW2320NGDH
- Groups: AP Group: default-group, Flex Group: default-flex-group
- Mode / Sub-mode: Local / Not Configured
- Max Capabilities: 802.11n 2.4GHz, 802.11ac 5GHz, Spatial Streams: 2 (2.4GHz), 2 (5.0GHz), Max. Data Rate: 144 Mbps (2.4GHz), 867 Mbps (5.0GHz)
- Fabric: Disabled

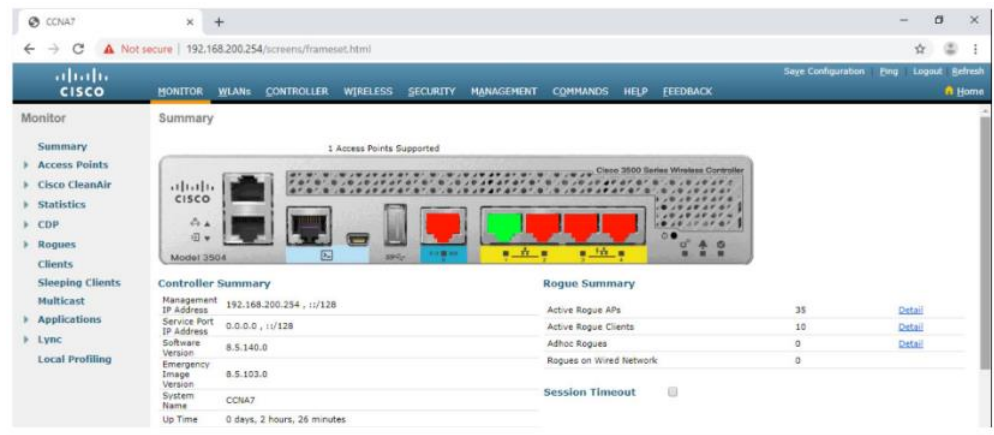
On the right is a 'PERFORMANCE SUMMARY' table comparing 2.4GHz and 5GHz metrics:

	2.4GHz	5GHz
Number of clients	1	0
Channels	11	(100, 104, 108, 112)
Configured Rate	Min: 1 Mbps, Max: 144 Mbps	Min: 6 Mbps, Max: 867 Mbps
Usage Traffic	709.4 MB	231.1 KB
Throughput	2.1 KB	0
Transmit Power	20 dBm	20 dBm
Noise	-90	-93 -95 -95 -95
Channel Utilization	9%	1%
Interference	7%	1%
Traffic	2%	0%
Air Quality	-	-
Admin Status	Enabled	Enabled
Clean Air Status	Not applicable	Not applicable

Configure a Basic WLAN on the WLC Advanced Settings

Most WLC will come with some basic settings and menus that users can quickly access to implement a variety of common configurations.

- However, as a network administrator, you will typically access the advanced settings.
- For the Cisco 3504 Wireless Controller, click **Advanced** in the upper right-hand corner to access the advanced **Summary** page.
- From here, you can access all the features of the WLC.



Configure a Basic WLAN on the WLC

Configure a WLAN

Wireless LAN Controllers have Layer 2 switch ports and virtual interfaces that are created in software and are very similar to VLAN interfaces.

- Each physical port can support many APs and WLANs.
- The ports on the WLC are essentially trunk ports that can carry traffic from multiple VLANs to a switch for distribution to multiple APs.
- Each AP can support multiple WLANs.



Configure a Basic WLAN on the WLC

Configure a WLAN (Cont.)

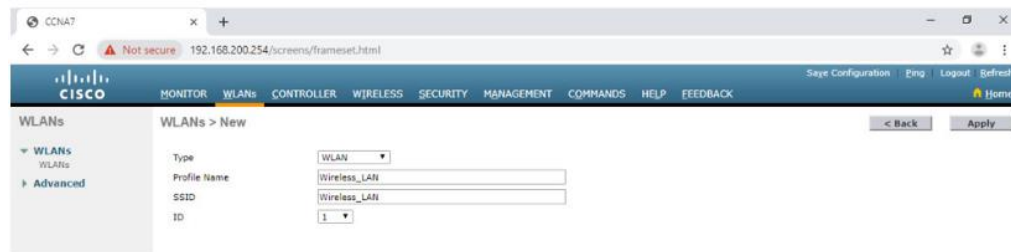
Basic WLAN configuration on the WLC includes the following steps:

1. Create the WLAN
2. Apply and Enable the WLAN
3. Select the Interface
4. Secure the WLAN
5. Verify the WLAN is Operational
6. Monitor the WLAN
7. View Wireless Client Information

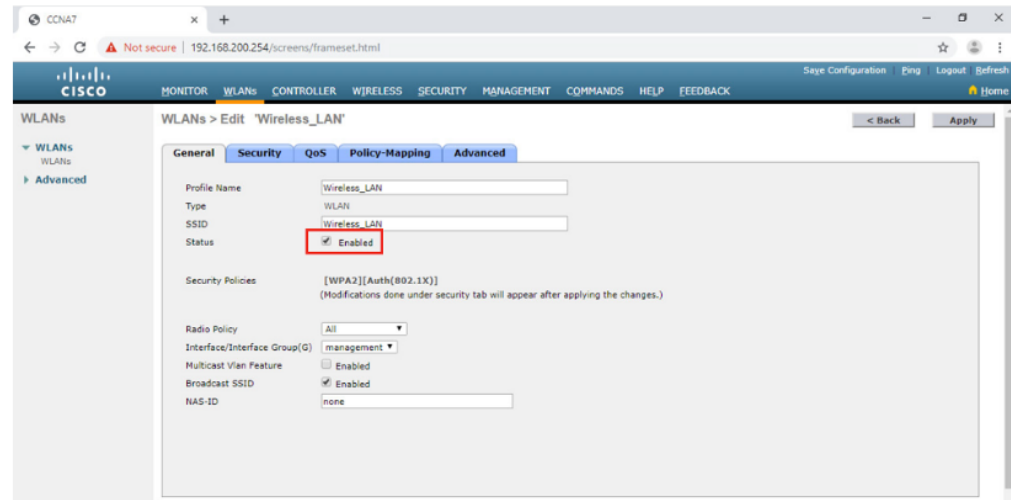
Configure a Basic WLAN on the WLC

Configure a WLAN (Cont.)

1. **Create the WLAN:** In the figure, a new WLAN with an SSID name **Wireless_LAN** is created.



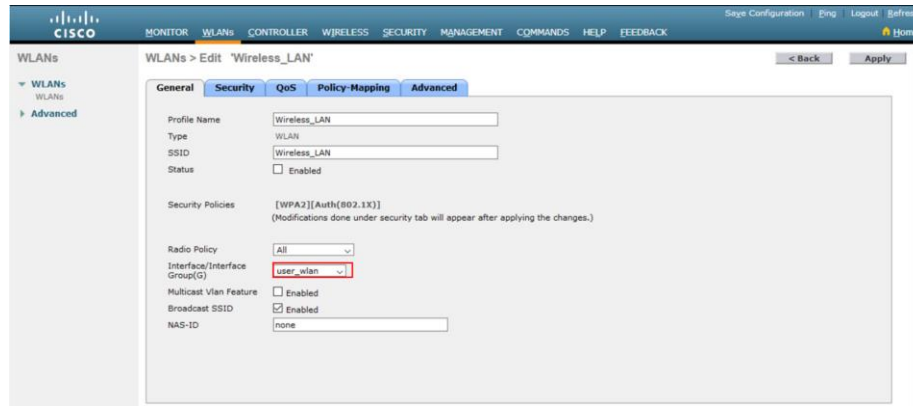
2. **Apply and Enable the WLAN:** Next the WLAN is enabled the WLAN settings are configured.



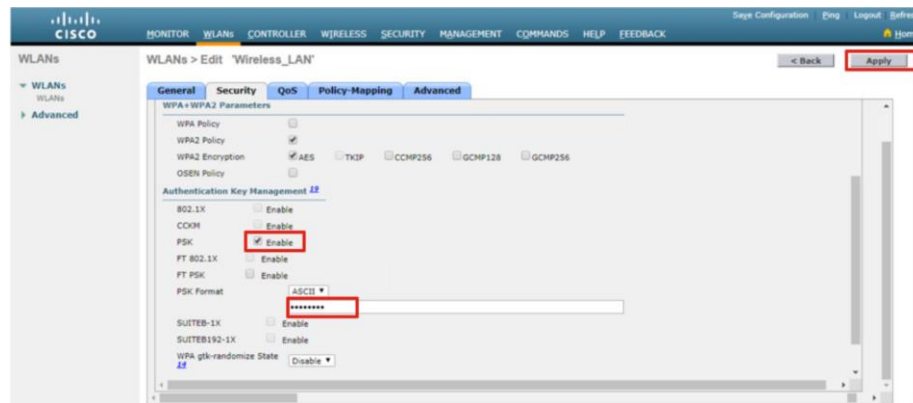
Configure a Basic WLAN on the WLC

Configure a WLAN (Cont.)

- Select the Interface:** The interface that will carry the WLAN traffic must be selected.



- Secure the WLAN:** The Security tab is used to access all the available options for securing the LAN.

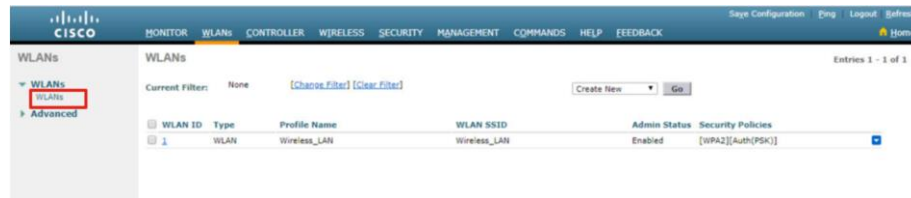


Configure a Basic WLAN on the WLC

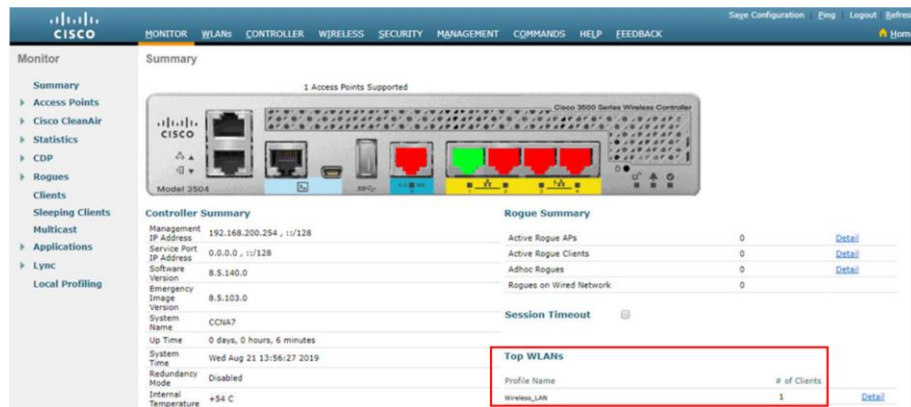
Configure a WLAN (Cont.)

5. Verify the WLAN is Operational:

The **WLANs** menu on the left is used to view the newly configured WLAN and its settings.



6. Monitor the WLAN: The Monitor tab is used to access the advanced Summary page and confirm that the **Wireless_LAN** now has one client using its services.



Configure a Basic WLAN on the WLC

Configure a WLAN (Cont.)

7. **View Wireless Client Details:**
Click **Clients** in the left menu to view more information about the clients connected to the WLAN.



The screenshot shows the Cisco WLC Monitor page with the 'Clients' tab selected. The left sidebar contains a 'Monitor' menu with options: Summary, Access Points, Cisco CleanAir, Statistics, CDP, Rogues, and Clients (highlighted with a red box). The main content area displays a table of connected clients. The table has columns for Client MAC Addr, IP Address(Ipv4/Ipv6), AP Name, WLAN Profile, and WLAN SSID. A single client is listed with MAC address 00:12:0c:57:7c:57, IP address 192.168.5.2, AP name AP1, WLAN profile Wireless_LAN, and WLAN SSID Wireless_LAN. Above the table, there are links for 'Change Filter' and 'Clear Filter', and a status 'Entries 1 - 1 of 1'.

Client MAC Addr	IP Address(Ipv4/Ipv6)	AP Name	WLAN Profile	WLAN SSID
00:12:0c:57:7c:57	192.168.5.2	AP1	Wireless_LAN	Wireless_LAN

Packet Tracer – Configure a Basic WLAN on the WLC

In this lab, you will explore some of the features of a wireless LAN controller.

- You will create a new WLAN on the controller and implement security on that LAN.
- Then you will configure a wireless host to connect to the new WLAN through an AP that is under the control of the WLC.
- Finally, you will verify connectivity.

13.5 Module Practice and Summary